

## WEST Search History





DATE: Monday, April 26, 2004

<b>Hide?</b>	<b>Set Name</b>	<b>Query</b>	<b>Hit Count</b>
	<i>DB=USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L13	cpap and (average adj pressure)	16
<input type="checkbox"/>	L12	(first adj average adj pressure) and (second adj average adj pressure)	10
	<i>DB=USPT; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L11	(first adj average adj pressure) and (second adj average adj pressure)	9
<input type="checkbox"/>	L10	6609517[uref]	0
<input type="checkbox"/>	L9	cpap and (average adj pressure)	16
<input type="checkbox"/>	L8	cpap and (average adj3 pressure)	55
<input type="checkbox"/>	L7	leak and (average (1a) pressure)	0
<input type="checkbox"/>	L6	cpap and (average (1a) pressure)	0
<input type="checkbox"/>	L5	cpap and (average (1w) pressure)	0
<input type="checkbox"/>	L4	L1 and (average (3a) pressure)	0
<input type="checkbox"/>	L3	average (3w) pressure	0
<input type="checkbox"/>	L2	L1 and (average (3w) pressure)	0
<input type="checkbox"/>	L1	cpap and average	186

END OF SEARCH HISTORY

[First Hit](#)   [Fwd Refs](#)[Search Forms](#)[Search Results](#)[Help](#)[User Searches](#)

Entry 6 of 16

File: USPT

Dec 8, 1998

[Preferences](#)[Logout](#)

DOCUMENT-IDENTIFIER: US 5845636 A

TITLE: Method and apparatus for maintaining patient airway patency

Brief Summary Text (9):

In order to treat obstructive sleep apnea, the so-called continuous positive airway pressure (CPAP) system has been devised in which a prescribed level of positive airway pressure is continuously imposed on the patient's airways. The presence of such positive pressure on the airways provides a pressure splint to offset the negative inspiratory pressure to maintain tissue position tension and thereby maintain an open patient airway. The positive airway connection with a patient is typically achieved by way of a nasal pillow such as that disclosed in U.S. Pat. No. 4,782,832 hereby incorporated by reference in which the nasal pillow seals with the patient's nares and imposes the positive airway pressure on the nasal passages.

Brief Summary Text (10):

The CPAP system meets with objections from patients, however, because the patient must exhale against the positive pressure. This increases the work to exhale. Some patients have difficulty getting used to this and as a result, may discontinue the therapy. Drying of the nose and airway due to continuous circulation of room air is also a complaint. Also, exhaled carbon dioxide tends to remain in some nasal masks with CPAP therapy.

Brief Summary Text (11):

In prescribing CPAP therapy, it is usually necessary for a patient to spend one or two nights in a sleep treatment laboratory where it is first determined whether the patient has a respiratory disorder such as sleep apnea. If so, the patient is then fitted with a CPAP device whereupon the required gas pressure is determined for providing the necessary air splint to maintain airway patency.

Drawing Description Text (29):

FIG. 28 is a computer program flowchart of the CPAP BACKUP module of the PRIMARY module;

Detailed Description Text (52):

Step 1112 sets the pressure set point for the inhalation phase according to the inhalation prescription value set on switch array 814 according to data in a look-up table. This step also defines the start-up mode of the apparatus as continuous positive airway pressure (CPAP). That is to say, and as explained further hereinbelow, the program operates apparatus 10 in order to present a continuous positive pressure at the inhalation set point pressure for the first eight breaths of a patient. Step 1112 also initializes the breath counter at zero in preparation for counting patient breathing cycles.

Detailed Description Text (53):

After completion of step 1112 the program moves to MAIN LOOP 1200 of the main routine as illustrated in FIG. 12. Step 1202 is the first step of this routine in which the program calculates the average pressure as sensed by pressure transducer 701 over eight ADC conversions. That is to say, microcontroller 802 includes an internal "ring" buffer which stores the eight most recent pressure readings received at microcontroller terminal ACH0 (and also ACH1 in the two-conduit

embodiment). As discussed further hereinbelow, ADC interrupt routine converts the input analog values to digital form every 22 microseconds and continuously stores the most recent digital values in the ring buffer. Step 1020 calculates the average value by dividing the cumulative buffer value by eight. Step 1202 also calculates the deviation, that is, error, in the average pressure from the pressure set point.

Detailed Description Text (62):

After sufficient time has elapsed to exceed the default time set for the inhalation end time, and when the slope of the valve position curve is equal to or less than -5 indicating the end of patient inhalation, the answer in step 1216 is yes and the program moves to step 1218 which asks whether the mode of operation is set for inspiratory nasal air pressure (INAP). This was initialized in the CPAP mode in step 1112. During the first eight breathing cycles, the answer in step 1226 is no, and the program moves to step 1228 which asks whether the breath counter is less than or equal to eight. The breath counter was initialized at zero and during the first pass of the program the answer in step 1220 is yes, and the program moves to step 1230 to increment the breath counter.

Detailed Description Text (150):

FIGS. 28-30 illustrate the three selectable backup modes which are executed if inhalation is not detected within a time limit based on breath rate. In the CPAP mode (FIG. 28), the pressure is increased to a constant value and maintained. In the BPM backup mode (FIG. 29), the patient pressure is increased to a high level and maintained until the earliest occurrence of sensed exhalation or a time correlated with previous breath rates. The patient backup mode (FIG. 30) results in a high pressure being delivered to the patient for a fixed time not based on previous breath rates, or when exhalation is sensed, whichever occurs first.

Detailed Description Text (151):

Turning first to FIG. 28, CPAP BACKUP module 2800 enters at step 2802 which asks whether the backup test is true. More particular, this step asks whether the pressure control mode is set for exhale, the backup flag is clear, and the count on the exhale timer is greater than the average of the last three exhale periods plus five seconds. If all of these conditions are true, then the answer in step 2802 is yes. The program then moves to step 2804 which sets the pressure control mode to inhale and then in step 2806 sets the backup flag as true.

[First Hit](#)   [Fwd Refs](#) **Generate Collection** **Print**

L9: Entry 9 of 16

File: USPT

Aug 18, 1998

DOCUMENT-IDENTIFIER: US 5794614 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Apparatus for compensating for flow and pressure variances in pneumatic circuits

Brief Summary Text (9):

In order to treat obstructive sleep apnea, the so-called continuous positive airway pressure (CPAP) system has been devised in which a prescribed level of positive airway pressure is continuously imposed on the patient's airways. The presence of such positive pressure on the airways provides a pressure splint to offset the negative inspiratory pressure to maintain tissue position tension and thereby maintain an open patient airway; The positive airway connection with a patient is typically achieved by way of a nasal pillow such as that disclosed in U.S. Pat. No. 4,782,832 hereby incorporated by reference in which the nasal pillow seals with the patient's nares and imposes the positive airway pressure on the nasal passages.

Brief Summary Text (10):

The CPAP system meets with objections from patients, however, because the patient must exhale against the positive pressure. This increases the work to exhale. Some patients have difficulty getting used to this and as a result, may discontinue the therapy. Drying of the nose and airway due to continuous circulation of room air is also a complaint. Also, exhaled carbon dioxide tends to remain in some nasal masks with CPAP therapy.

Brief Summary Text (11):

In prescribing CPAP therapy, it is usually necessary for a patient to spend one or two nights in a sleep treatment laboratory where it is first determined whether the patient has a respiratory disorder such as sleep apnea. If so, the patient is then fitted with a CPAP device whereupon the required gas pressure is determined for providing the necessary air splint to maintain airway patency.

Drawing Description Text (29):

FIG. 28 is a computer program flowchart of the CPAP BACKUP module of the PRIMARY module;

Detailed Description Text (52):

Step 1112 sets the pressure set point for the inhalation phase according to the inhalation prescription value set on switch array 814 according to data in a look-up table. This step also defines the start-up mode of the apparatus as continuous positive airway pressure (CPAP). That is to say, and as explained further hereinbelow, the program operates apparatus 10 in order to present a continuous positive pressure at the inhalation set point pressure for the first eight breaths of a patient. Step 1112 also initializes the breath counter at zero in preparation for counting patient breathing cycles.

Detailed Description Text (53):

After completion of step 1112 the program moves to MAIN LOOP 1200 of the main routine as illustrated in FIG. 12. Step 1202 is the first step of this routine in which the program calculates the average pressure as sensed by pressure transducer 701 over eight ADC conversions. That is to say, microcontroller 802 includes an

internal "ring" buffer which stores the eight most recent pressure readings received at microcontroller terminal ACH0 (and also ACH1 in the two-conduit embodiment). As discussed further hereinbelow, ADC interrupt routine converts the input analog values to digital form every 22 microseconds and continuously stores the most recent digital values in the ring buffer. Step 1020 calculates the average value by dividing the cumulative buffer value by eight. Step 1202 also calculates the deviation, that is, error, in the average pressure from the pressure set point.

Detailed Description Text (62):

After sufficient time has elapsed to exceed the default time set for the inhalation end time, and when the slope of the valve position curve is equal to or less than -5 indicating the end of patient inhalation, the answer in step 1216 is yes and the program moves to step 1218 which asks whether the mode of operation is set for inspiratory nasal air pressure (INAP). This was initialized in the CPAP mode in step 1112. During the first eight breathing cycle, the answer in step 1226 is no, and the program moves to step 1228 which asks whether the breath counter is less than or equal to eight. The breath counter was initialized at zero and during the first pass of the program the answer in step 1220 is yes, and the program moves to step 1230 to increment the breath counter.

Detailed Description Text (150):

FIGS. 28-30 illustrate the three selectable backup modes which are executed if inhalation is not detected within a time limit based on breath rate. In the CPAP mode (FIG. 28), the pressure is increased to a constant value and maintained. In the BPM backup mode (FIG. 29), the patient pressure is increased to a high level and maintained until the earliest occurrence of sensed exhalation or a time correlated with previous breath rates. The patient backup mode (FIG. 30) results in a high pressure being delivered to the patient for a fixed time not based on previous breath rates, or when exhalation is sensed, whichever occurs first.

Detailed Description Text (151):

Turning first to FIG. 28, CPAP BACKUP module 2800 enters at step 2802 which asks whether the backup test is true. More particular, this step asks whether the pressure control mode is set for exhale, the backup flag is clear, and the count on the exhale timer is greater than the average of the last three exhale periods plus five seconds. If all of these conditions are true, then the answer in step 2802 is yes. The program then moves to step 2804 which sets the pressure control mode to inhale and then in step 2806 sets the backup flag as true.

[First Hit](#)   [Fwd Refs](#)Generate CollectionPrint

L9: Entry 10 of 16

File: USPT

Aug 27, 1996

DOCUMENT-IDENTIFIER: US 5549106 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Inspiratory airway pressure system using constant pressure and measuring flow signals to determine airway patency

Brief Summary Text (9):

In order to treat obstructive sleep apnea, the so-called continuous positive airway pressure (CPAP) system has been devised in which a prescribed level of positive airway pressure is continuously imposed on the patient's airways. The presence of such positive pressure on the airways provides a pressure splint to offset the negative inspiratory pressure to maintain tissue position tension and thereby maintain an open patient airway. The positive airway connection with a patient is typically achieved by way of a nasal pillow such as that disclosed in U.S. Pat. No. 4,782,832 hereby incorporated by reference in which the nasal pillow seals with the patient's nares and imposes the positive airway pressure on the nasal passages.

Brief Summary Text (10):

The CPAP system meets with objections from patients, however, because the patient must exhale against the positive pressure. This increases the work to exhale. Some patients have difficulty getting used to this and as a result, may discontinue the therapy. Drying of the nose and airway due to continuous circulation of room air is also a complaint. Also, exhaled carbon dioxide tends to remain in some nasal masks with CPAP therapy.

Brief Summary Text (11):

In prescribing CPAP therapy, it is usually necessary for a patient to spend one or two nights in a sleep treatment laboratory where it is first determined whether the patient has a respiratory disorder such as sleep apnea. If so, the patient is then fitted with a CPAP device whereupon the required gas pressure is determined for providing the necessary air splint to maintain airway patency.

Drawing Description Text (29):

FIG. 28 is a computer program flowchart of the CPAP BACKUP module of the PRIMARY module;

Detailed Description Text (52):

Step 1112 sets the pressure set point for the inhalation phase according to the inhalation prescription value set on switch array 814 according to data in a look-up table. This step also defines the start-up mode of the apparatus as continuous positive airway pressure (CPAP). That is to say, and as explained further hereinbelow, the program operates apparatus 10 in order to present a continuous positive pressure at the inhalation set point pressure for the first eight breaths of a patient. Step 1112 also initializes the breath counter at zero in preparation for counting-patient breathing cycles.

Detailed Description Text (53):

After completion of step 1112 the program moves to MAIN LOOP 1200 of the main routine as illustrated in FIG. 12. Step 1202 is the first step of this routine in which the program calculates the average pressure as sensed by pressure transducer 701 over eight ADC conversions. That is to say, microcontroller 802 includes an

internal "ring" buffer which stores the eight most recent pressure readings received at microcontroller terminal ACH0 (and also ACH1 in the two-conduit embodiment). As discussed further hereinbelow, ADC interrupt routine converts the input analog values to digital form every 22 microseconds and continuously stores the most recent digital values in the ring buffer. Step 1020 calculates the average value by dividing the cumulative buffer value by eight. Step 1202 also calculates the deviation, that is, error, in the average pressure from the pressure set point.

Detailed Description Text (62):

After sufficient time has elapsed to exceed the default time set for the inhalation end time, and when the slope of the valve position curve is equal to or less than -5 indicating the end of patient inhalation, the answer in step 1216 is yes and the program moves to step 1218 which asks whether the mode of operation is set for inspiratory nasal air pressure (INAP). This was initialized in the CPAP mode in step 1112. During the first eight breathing cycle, the answer in step 1226 is no, and the program moves to step 1228 which asks whether the breath counter is less than or equal to eight. The breath counter was initialized at zero and during the first pass of the program the answer in step 1220 is yes, and the program moves to step 1230 to increment the breath counter.

Detailed Description Text (150):

FIGS. 28-30 illustrate the three selectable backup modes which are executed if inhalation is not detected within a time limit based on breath rate. In the CPAP mode (FIG. 28), the pressure is increased to a constant value and maintained. In the BPM backup mode (FIG. 29), the patient pressure is increased to a high level and maintained until the earliest occurrence of sensed exhalation or a time correlated with previous breath rates. The patient backup mode (FIG. 30) results in a high pressure being delivered to the patient for a fixed time not based on previous breath rates, or when exhalation is sensed, whichever occurs first.

Detailed Description Text (151):

Turning first to FIG. 28, CPAP BACKUP module 2800 enters at step 2802 which asks whether the backup test is true. More particular, this step asks whether the pressure control mode is set for exhale, the backup flag is clear, and the count on the exhale timer is greater than the average of the last three exhale periods plus five seconds. If all of these conditions are true, then the answer in step 2802 is yes. The program then moves to step 2804 which sets the pressure control mode to inhale and then in step 2806 sets the backup flag as true.

[First Hit](#)   [Fwd Refs](#)[Search Forms](#) [Print](#)[Search Results](#)[Help](#)[User Searches](#)

19: Entry 12 of 16

File: USPT

Nov 9, 1993

[Preferences](#)[Logout](#)

DOCUMENT-IDENTIFIER: US 5259373 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Inspiratory airway pressure system controlled by the detection and analysis of patient airway sounds

Brief Summary Text (9):

In order to treat obstructive sleep apnea, the so-called continuous positive airway pressure (CPAP) system has been devised in which a prescribed level of positive airway pressure is continuously imposed on the patient's airways. The presence of such positive pressure on the airways provides a pressure splint to offset the negative inspiratory pressure to maintain tissue position tension and thereby maintain an open patient airway. The positive airway connection with a patient is typically achieved by way of a nasal pillow such as that disclosed in U.S. Pat. No. 4,782,832 hereby incorporated by reference in which the nasal pillow seals with the patient's nares and imposes the positive airway pressure on the nasal passages.

Brief Summary Text (10):

The CPAP system meets with objections from patients, however, because the patient must exhale against the positive pressure. This increases the work to exhale. Some patients have difficulty getting used to this and as a result, may discontinue the therapy. Drying of the nose and airway due to continuous circulation of room air is also a complaint. Also, exhaled carbon dioxide tends to remain in some nasal masks with CPAP therapy.

Brief Summary Text (11):

In prescribing CPAP therapy, it is usually necessary for a patient to spend one or two nights in a sleep treatment laboratory where it is first determined whether the patient has a respiratory disorder such as sleep apnea. If so, the patient is then fitted with a CPAP device whereupon the required gas pressure is determined for providing the necessary air splint to maintain airway patency.

Drawing Description Text (29):

FIG. 28 is a computer program flowchart of the CPAP BACKUP module of the PRIMARY module;

Detailed Description Text (52):

Step 1112 sets the pressure set point for the inhalation phase according to the inhalation prescription value set on switch array 814 according to data in a look-up table. This step also defines the start-up mode of the apparatus as continuous positive airway pressure (CPAP). That is to say, and as explained further hereinbelow, the program operates apparatus 10 in order to present a continuous positive pressure at the inhalation set point pressure for the first eight breaths of a patient. Step 1112 also initializes the breath counter at zero in preparation for counting patient breathing cycles.

Detailed Description Text (53):

After completion of step 1112 the program moves to MAIN LOOP 1200 of the main routine as illustrated in FIG. 12. Step 1202 is the first step of this routine in which the program calculates the average pressure as sensed by pressure transducer 701 over eight ADC conversions. That is to say, microcontroller 802 includes an



internal "ring" buffer which stores the eight most recent pressure readings received at microcontroller terminal ACH0 (and also ACH1 in the two-conduit embodiment). As discussed further hereinbelow, ADC interrupt routine converts the input analog values to digital form every 22 microseconds and continuously stores the most recent digital values in the ring buffer. Step 1020 calculates the average value by dividing the cumulative buffer value by eight. Step 1202 also calculates the deviation, that is, error, in the average pressure from the pressure set point.

Detailed Description Text (62):

After sufficient time has elapsed to exceed the default time set for the inhalation end time, and when the slope of the valve position curve is equal to or less than -5 indicating the end of patient inhalation, the answer in step 1216 is yes and the program moves to step 1218 which asks whether the mode of operation is set for inspiratory nasal air pressure (INAP). This was initialized in the CPAP mode in step 1112. During the first eight breathing cycle, the answer in step 1226 is no, and the program moves to step 1228 which asks whether the breath counter is less than or equal to eight. The breath counter was initialized at zero and during the first pass of the program the answer in step 1220 is yes, and the program moves to step 1230 to increment the breath counter.

Detailed Description Text (150):

FIGS. 28-30 illustrate the three selectable backup modes which are executed if inhalation is not detected within a time limit based on breath rate. In the CPAP mode (FIG. 28), the pressure is increased to a constant value and maintained. In the BPM backup mode (FIG. 29), the patient pressure is increased to a high level and maintained until the earliest occurrence of sensed exhalation or a time correlated with previous breath rates. The patient backup mode (FIG. 30) results in a high pressure being delivered to the patient for a fixed time not based on previous breath rates, or when exhalation is sensed, whichever occurs first.

Detailed Description Text (151):

Turning first to FIG. 28, CPAP BACKUP module 2800 enters at step 2802 which asks whether the backup test is true. More particular, this step asks whether the pressure control mode is set for exhale, the backup flag is clear, and the count on the exhale timer is greater than the average of the last three exhale periods plus five seconds. If all of these conditions are true, then the answer in step 2802 is yes. The program then moves to step 2804 which sets the pressure control mode to inhale and then in step 2806 sets the backup flag as true.

First Hit   Fwd RefsGenerate CollectionPrint

L9: Entry 13 of 16

File: USPT

Aug 4, 1992

DOCUMENT-IDENTIFIER: US 5134995 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Inspiratory airway pressure system with admittance determining apparatus and method

Brief Summary Text (9):

In order to treat obstructive sleep apnea, the so-called continuous positive airway pressure (CPAP) system has been devised in which a prescribed level of positive airway pressure is continuously imposed on the patient's airways. The presence of such positive pressure on the airways provides a pressure splint to offset the negative inspiratory pressure to maintain tissue position tension and thereby maintain an open patient airway. The positive airway connection with a patient is typically achieved by way of a nasal pillow such as that disclosed in U.S. Pat. No. 4,782,832 hereby incorporated by reference in which the nasal pillow seals with the patient's nares and imposes the positive airway pressure on the nasal passages.

Brief Summary Text (10):

The CPAP system meets with objections from patients, however, because the patient must exhale against the positive pressure. This increases the work to exhale. Some patients have difficulty getting used to this and as result, may discontinue the therapy. Drying of the nose and airway due to continuous circulation of room air is also a complaint. Also, exhaled carbon dioxide tends to remain in some nasal masks with CPAP therapy.

Brief Summary Text (11):

In prescribing CPAP therapy, it is usually necessary for a patient to spend one or two nights in a sleep treatment laboratory where it is first determined whether the patient has a respiratory disorder such as sleep apnea. If so, the patient is then fitted with a CPAP device whereupon the required gas pressure is determined for providing the necessary air splint to maintain airway patency.

Drawing Description Text (29):

FIG. 28 is a computer program flowchart of the CPAP BACKUP module of the PRIMARY module;

Detailed Description Text (52):

Step 1112 sets the pressure set point for the inhalation phase according to the inhalation prescription value set on switch array 814 according to data in a look-up table. This step also defines the start-up mode of the apparatus as continuous positive airway pressure (CPAP). That is to say, and as explained further hereinbelow, the program operates apparatus 10 in order to present a continuous positive pressure at the inhalation set point pressure for the first eight breaths of a patient. Step 1112 also initializes the breath counter at zero in preparation for counting patient breathing cycles.

Detailed Description Text (53):

After completion of step 1112 the program moves to MAIN LOOP 1200 of the main routine as illustrated in FIG. 12. Step 1202 is the first step of this routine in which the program calculates the average pressure as sensed by pressure transducer 701 over eight ADC conversions. That is to say, microcontroller 802 includes an

internal "ring" buffer which stores the eight most recent pressure readings received at microcontroller terminal ACHO (and also ACH1 in the two-conduit embodiment). As discussed further hereinbelow, ADC interrupt routine converts the input analog values to digital form every 22 microseconds and continuously stores the most recent digital values in the ring buffer. Step 1020 calculates the average value by dividing the cumulative buffer value by eight. Step 1202 also calculates the deviation, that is, error, in the average pressure from the pressure set point.

Detailed Description Text (62):

After sufficient time has elapsed to exceed the default time set for the inhalation end time, and when the slope of the valve position curve is equal to or less than - 5 indicating the end of patient inhalation, the answer in step 1216 is yes and the program moves to step 1218 which asks whether the mode of operation is set for inspiratory nasal air pressure (NAP). This was initialized in the CPAP mode in step 1112. During the first eight breathing cycle, the answer in step 1226 is no, and the program moves to step 1228 which asks whether the breath counter is less than or equal to eight. The breath counter was initialized at zero and during the first pass of the program the answer in step 1220 is yes, and the program moves to step 1230 to increment the breath counter.

Detailed Description Text (150):

FIGS. 28-30 illustrate the three selectable backup modes which are executed if inhalation is not detected within a time limit based on breath rate. In the CPAP mode (FIG. 28), the pressure is increased to a constant value and maintained. In the BPM backup mode (FIG. 29), the patient pressure is increased to a high level and maintained until the earliest occurrence of sensed exhalation or a time correlated with previous breath rates. The patient backup mode (FIG. 30) results in a high pressure being delivered to the patient for a fixed time not based on previous breath rates, or when exhalation is sensed, whichever occurs first.

Detailed Description Text (151):

Turning first to FIG. 28, CPAP BACKUP module 2800 enters at step 2802 which asks whether the backup test is true. More particular, this step asks whether the pressure control mode is set for exhale, the backup flag is clear, and the count on the exhale timer is greater than the average of the last three exhale periods plus five seconds. If all of these condition are true, then the answer in step 2802 is yes. The program then moves to step 2804 which sets the pressure control mode to inhale and then in step 2806 sets the backup flag as true.